



Book on Epoxy Resins Technology

*(Manufacturing Process, Synthesis, Epoxy
Resin Adhesives and Epoxy Coatings)*

Introduction

Epoxy resin is a significant raw material to many end-use chemical compounds, where per molecule holds the capability of being converted to a useful thermosetting product. The major end-use markets for epoxy resins include electronics and paints & coatings, followed by adhesives, composites, wind turbines, and others.



The term epoxy has been widely adapted for many uses beyond its original use for fiber-reinforced polymer composites. Today, epoxy adhesives are sold in local hardware stores, and epoxy resin is used as the binder in countertops or coatings for floors. The myriad uses for epoxy continue to expand, and variants of epoxies are constantly being developed to fit the industries and products they are used in.



Here are some things that epoxy resin is used in:

- **General-purpose adhesives**
- **Binder in cement and mortars**
- **Rigid foams**
- **Nonskid coatings**
- **Solidifying sandy surfaces in oil drilling**
- **Industrial coatings**
- **Potting and encapsulating media**
- **Fiber-reinforced plastics**



Epoxy resin refers to a type of reactive prepolymer and polymer containing epoxide groups. These resins react either with themselves in the presence of catalysts, or with many co-reactants like amines, phenols, thiols, etc.

Epoxy resin has many industrial applications for a variety of purposes. It possesses higher mechanical properties and more thermal and chemical resistance than other types of resin. Therefore, it has exclusive use in making aircraft components. Epoxy resin is also called polyepoxides.

Epoxy resin also finds uses in caulking and casting compounds, sealants, varnishes and paints, and other industrial applications.

Applications

Applications for epoxy resins are extensive and include:

- **Paints and coatings.**
- **Adhesives.**
- **Composite materials such as those using carbon fibre and fiberglass reinforcements.**
- **Industrial tooling and composites.**
- **Electrical systems and electronics.**
- **Consumer applications.**
- **Marine applications.**
- **Aerospace applications.**
- **Biology.**
- **Art.**

Market Outlook

The global epoxy resin market size was valued at \$6,826 million in 2015, and is anticipated to grow at a CAGR of 6.2% to reach \$10,264 million by 2022. Epoxy resin is corrosion, water, and chemical resistant; and has superior adhesion, thermal stability, durability, and mechanical strength that makes it attractive for the aircraft industry. However, fluctuating raw material cost and high prices of epoxy could hamper the market growth.

In the rapidly growing paints & coatings industry, epoxy resins are used in powder coatings applied to automotive & appliances parts, in solvent-borne coatings applied to substrates in corrosive environment, and water-based coatings as electrode position primers in automobiles.

In electronics industry these are widely used in the manufacturing of printed circuit boards (PCBs).

Modernized consumer electronics products in tandem with the growing urbanization and rising disposable income of consumers has resulted in massive demand of such products, which in turn has risen demand for epoxy resins. Increase in construction activities in many countries and revamping of the older structures coupled with consumer demand for feature-rich coatings has mainly driven the demand of epoxy in paints & coatings industry.



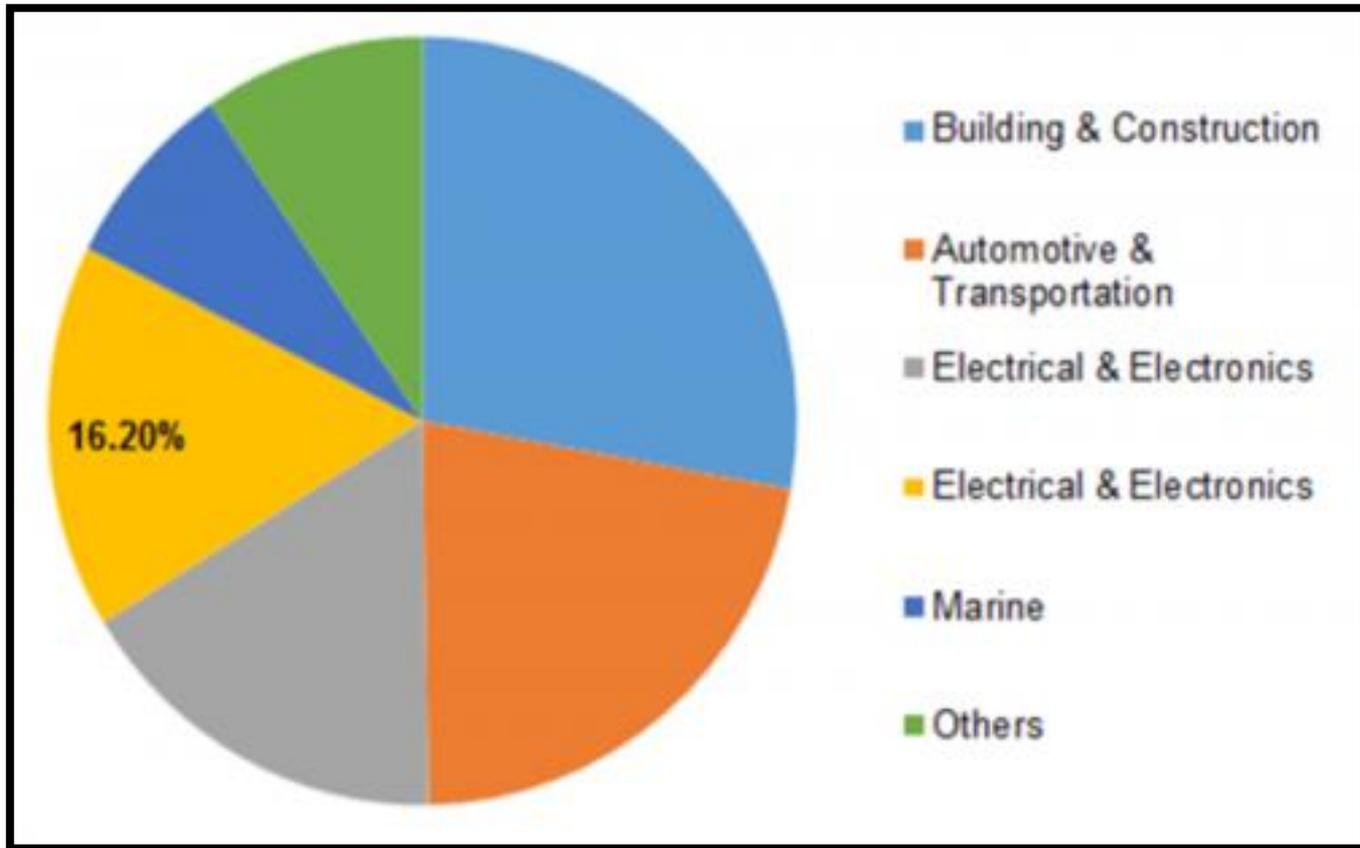
The market is divided into liquid epoxy, waterborne epoxy, solvent cut epoxy, and others. The liquid epoxy resin segment accounted for the largest share of the overall market due to its wide range of applications. Yet, waterborne epoxy is set to emerge as the fastest growing segment in the overall Epoxy Resin Market due to its increasing use in powder coating applications.



The Global Epoxy Resin Market is segmented into building & construction, automotive & transportation, electrical & electronics, adhesives & sealants, marine, and others. Building & construction industry is the leading segment, growing at a considerable CAGR to reach USD 2,988.8 million till 2023, on account of rapid infrastructural development around the world. Automotive industry is another substantial segment in the Global Epoxy Resin Market, which is growing at the highest CAGR due to increasing use of epoxy resin based materials for manufacturing parts of an automobiles.



Global Epoxy Resin Market Share, by Application, 2016 (%):



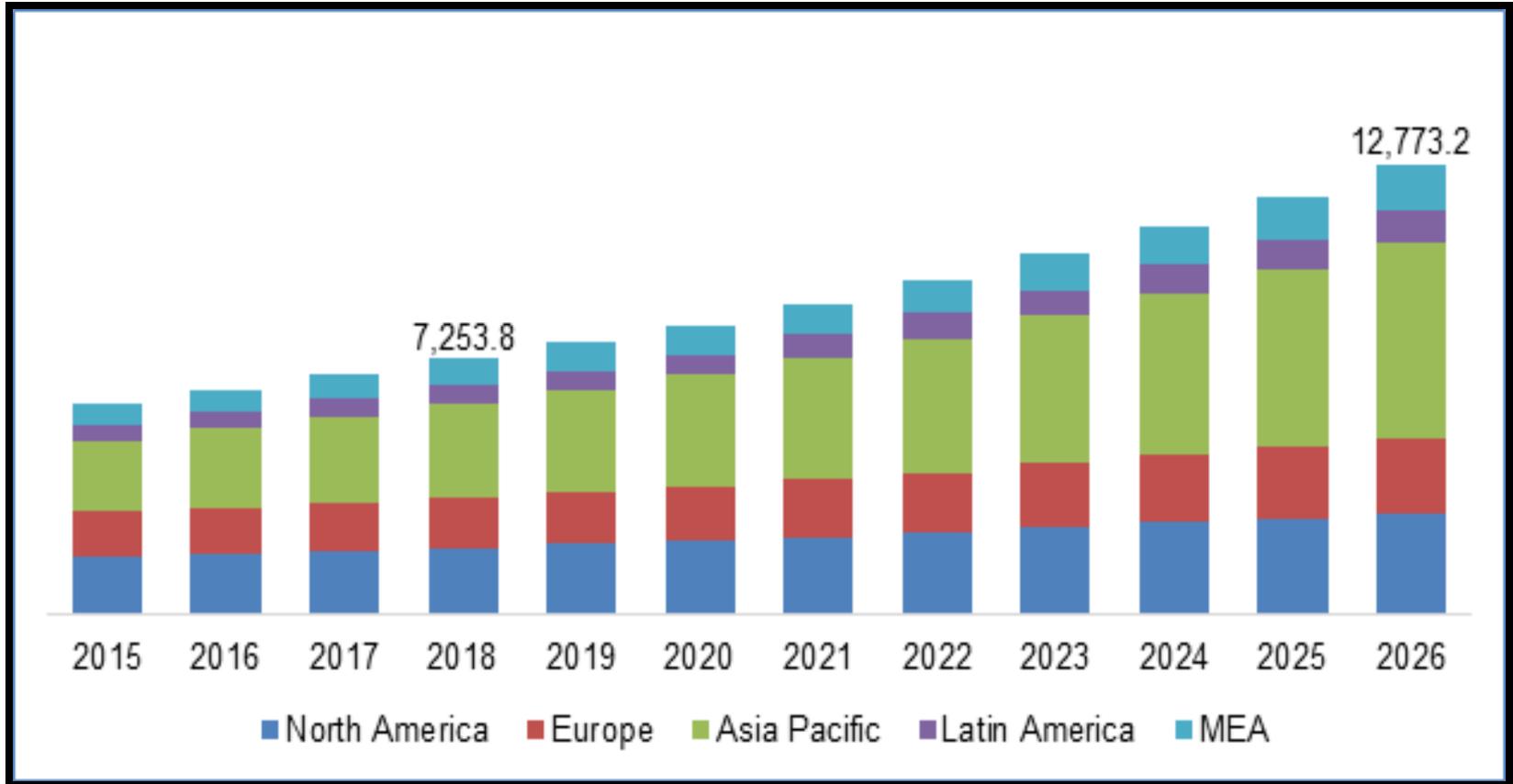
Epoxy resins have a wide range of applications in the industry. Its properties have made it valuable in the paints & coatings industry. It provides two basic advantages, which include decoration and protection. There are various types of paint and coatings used by industries for different purposes. These are anti-corrosive primers, primer tie coats, primer finishes, abrasion resistant coatings, and chemical, heat and fire resistant coatings. Similarly, epoxy floor paints and sealants are some other products that are used as coatings on the floor, in order to make it decorative and durable.



Global performance is underscored by capacity installation of wind energy and melting down of conventional sources of energy. The global market has been attributed with a strong market thanks to growth of end-use industries such as paints and coatings and adhesives. The paints and coatings industry advocates two parts of epoxies have been developed for heavy duty services. These epoxy compounds take pride in applications to many formulations of protective coatings, automatic coatings, powder coatings and many other solvent-based paints. Products are used in many dimensions including solid, liquid and solution and are present in every type of paint.



Epoxy Resin Market, By Region, 2015-2026 (USD Million)



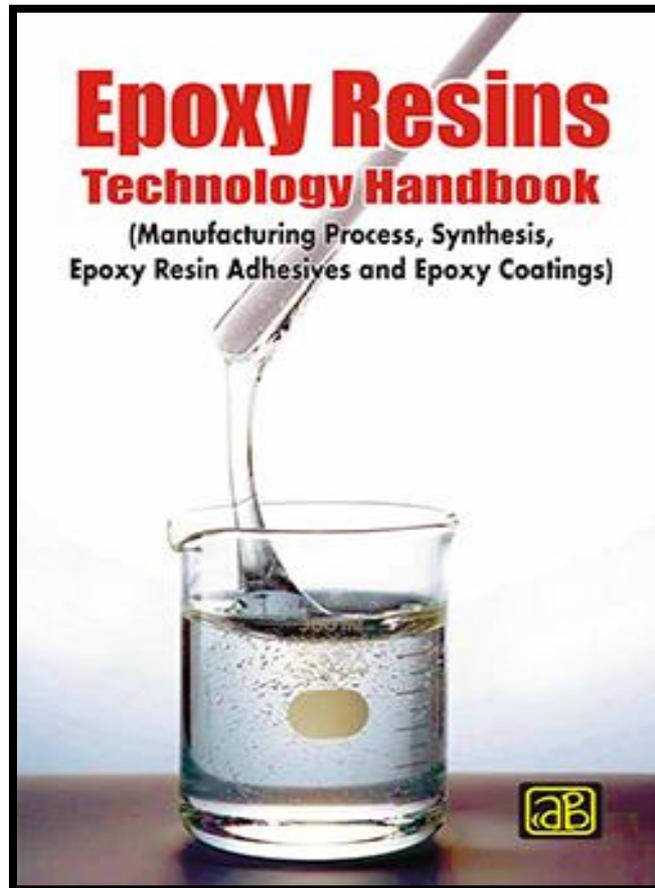
Epoxy demand in automobile and industrial applications is projected to grow on account of superior heat resistance as compared to latex based or alkyd based paints. Growing demand from water borne coatings, powder coatings, electrical & electronic laminates, flooring and paving applications is expected to further increase the growth.

Major Players: DowDuPont, Nan Ya Plastics, BASF SE, Hexion, Huntsman, Jiangsu Sanmu Group, Changchun Chemicals, and Dalian Qihua, among others



Epoxy Resins Technology Handbook

(Manufacturing Process, Synthesis, Epoxy Resin Adhesives and Epoxy Coatings) 2nd Revised Edition



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Epoxy is a term used to denote both the basic components and the cured end products of epoxy resins, as well as a colloquial name for the epoxide functional group. Epoxy resin are a class of thermoset materials used extensively in structural and specialty composite applications because they offer a unique combination of properties that are unattainable with other thermoset resins.

Epoxies are monomers or prepolymers that further reacts with curing agents to yield high performance thermosetting plastics. They have gained wide acceptance in protecting coatings, electrical and structural applications because of their exceptional combination of properties such as toughness, adhesion, chemical resistance and superior electrical properties.

Epoxy resins are characterized by the presence of a three membered cycle ether group commonly referred to as an epoxy group 1, 2-epoxide, or oxirane. The most widely used epoxy resins are diglycidyl ethers of bisphenol-A derived from bisphenol-A and epichlorohydrin.

The market of epoxy resins are growing day by day. Today the total business of this product is more than 100 crores. Epoxy resins are used for about 75% of wind blades currently produced worldwide, while polyester resins account for the remaining 25%. A standard 1.5-MW (megawatt) wind turbine has approximately 10 tonnes of epoxy in its blades. Traditionally, the markets for epoxy resins have been driven by demand generated primarily in areas of adhesives, building and civil construction, electrical insulation, printed circuit boards, and protective coatings for consumer durables, amongst others.

The major contents of the book are synthesis and characteristics of epoxy resin, manufacture of epoxy resins, epoxide curing reactions, the dynamic mechanical properties of epoxy resins, physical and chemical properties of epoxy resins, epoxy resin adhesives, epoxy resin coatings, epoxy coating give into water, electrical and electronic applications, analysis of epoxides and epoxy resins and the toxicology of epoxy resins.

It will be a standard reference book for professionals and entrepreneurs. Those who are interested in this field can find the complete information from manufacture to final uses of epoxy resin. This presentation will be very helpful to new entrepreneurs, technocrats, research scholars, libraries and existing units.

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Contact Details

Tags

#Epoxy_Resins_Manufacturing_Process, #Manufacturing_Process_of_Epoxy_Resins, #Epoxy_Resins, #Production_of_Epoxy_Resin, Making of Epoxy Resins, Epoxy Resin Formulation, #Epoxy_Resin_Manufacturing_Process_Pdf, Epoxy Resin Producing, Epoxy Resin Manufacturing Process & Applications, Process for Production of Epoxy Resin, #Epoxy_Resins_Industry, Epoxy Resin Manufacturing, Epoxy Resins Production, Epoxy Resin Manufacturing in India, Epoxy Resin Production Process Diagram, #Epoxy_Resin_Production_Process, #Epoxy_Resins_Technology_Handbook, Handbook of Epoxy Resins, Synthesis Resin, #Manufacturing_of_Synthetic_Resins_with_Formulation, Epoxy Resin Adhesives, Epoxy Resins Manufacture, #Epoxy_Adhesives, Epoxy Coatings, Epoxy Resin Manufacturing Plant, How to Start an Epoxy Resins Manufacturing Business, Cost for Setting up Epoxy Resins Manufacturing Business, Resin Manufacture, Epoxy Resin Plant, How to Start an Epoxy Resins Manufacturing Industry, Epoxy Resin Manufacturing Process Pdf, Manufacturing Process of Epoxy Pdf, Epoxy Resin Manufacturing Plant Cost, Manufacture of Epoxy Resins

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